

AMENDMENTS TO THE CLAIMS:

Complete Listing of Claims

Claim 1. (currently amended) In an electronic calculator comprising a processor, a display screen and a keyboard, a A method of operating the processor to select and organize ~~of organizing a multiplicity of rules to allow a user used~~ to change a selected expression displayed on the display screen ~~subject-matter~~ from a first state to a preferred state, comprising the steps of:

in response to a user input, determining a multiplicity of rules which are applicable to the selected expression;

arranging said multiplicity of rules according to a hierarchy of rules;

associating said multiplicity of rules with a plurality of nodes, and associating selected ones of said plurality of nodes with another plurality of nodes, such that said plurality of nodes and said another plurality of nodes are indicative of levels of said hierarchy of rules; and

defining unique identifiers for each of said plurality of nodes and said another plurality of nodes, said unique identifiers corresponding to individual rules and sets of related rules of said multiplicity of rules for changing said selected expression ~~subject-matter~~ from said first state to said preferred state; and

displaying on the display screen indicators for said unique identifiers that may be selected by the user to cause the rules to be applied to said selected expression to change it to said preferred state.

Claim 2. (original) The method of claim 1 wherein said step of associating further comprises the step of precluding inclusion of rules in a set of rules that could result in infinite looping or infinite recursion.

Claim 3. (original) The method of claim 2 wherein said unique identifiers for a plurality of nodes are selected so as to avoid designating contradictory rules that could result in infinite looping or infinite recursion.

Claim 4. (original). The method of claim 1 wherein said steps of arranging, associating and defining further comprises avoiding duplication of rules, sets of rules and node identifiers that are members of more than one set of rules.

Claim 5. (original) The method of claim 4 wherein said steps of arranging, associating, defining and avoiding comprises the step of organizing said rules in a directed acyclic format or graph (DAG) data structure.

Claim 6. (original) The method of claim 1 wherein said subject matter is selected from one of the group comprising mathematics, education, algebra, calculus and differential equations.

Claim 7. (original) The method of claim 5 wherein said subject matter is selected from one of the group comprising mathematics, education, algebra, calculus and differential equations.

Claim 8. (currently amended) The method of claim 1 wherein said method of organizing is implemented on a computer device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 9. (currently amended) The method of claim 3 wherein said method of organizing is implemented on a computer device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 10. (currently amended) The method of claim 4 wherein said method of organizing is implemented on a computer device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 11. (currently amended) The method of claim 5 wherein said method of organizing is implemented on a computer device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 12. (currently amended) In an electronic calculator comprising a processor, a display screen and a keyboard, a A method of operating the processor to select and organize ~~organizing a multiplicity of rules to allow a user~~ used to change a selected expression displayed on the display screen ~~subject matter~~ from a first state to a preferred state comprising the steps of:

in response to a user input, determining a multiplicity of rules which are applicable to the selected expression;

arranging said multiplicity of rules according to a hierarchy of rules;

determining which of the ~~indicating that certain~~ rules of said hierarchy are members of one or more sets with certain of these sets being members of other sets; and

indicating on the display screen which of these rules and sets can be selected.

Claim 13. (original) The method of claim 12 wherein said steps of arranging and indicating which rules can be selected precludes the selection of a set of rules that could result in infinite looping or infinite recursion.

Claim 14. (currently amended) In an electronic calculator comprising a processor, a display screen and a keyboard, a A method for operating the processor to select and organize rules to allow a user to change ~~changing~~ the state of a selected expression displayed on the display screen ~~selected-subject matter~~ from a first state to a preferred state comprising the steps of:

in response to a user input, determining ~~defining~~ a multiplicity of rules for changing said subject matter from one state to another;

organizing said multiplicity of rules comprising the steps of:

arranging said multiplicity of rules according to a hierarchy or rules,

associating said multiplicity of rules with a plurality of nodes, and

associating selected ones of said plurality of nodes with another plurality of nodes, such that said plurality of nodes and said another plurality of nodes are indicative of levels of said hierarchy of rules, and

defining unique identifiers for each of said nodes of said plurality of nodes and said another plurality of nodes, said unique identifiers corresponding to individual rules or sets of related rules of said multiplicity of rules for changing said subject matter from said first state to said preferred state;

displaying on said display screen indicators for said unique identifiers that may be selected by the user;

in response to the user selecting a displayed indicator, selecting a node from one of said plurality of nodes and said another plurality of nodes associated with said selected indicator, for selectively changing said selected expression ~~subject matter~~ from said first state to said preferred state;

applying one of said rules associated with said selected node to change said subject matter from said one state to said preferred state.

Claim 15. (original) The method of claim 14 wherein said unique identifiers for said plurality of nodes are selected so as to avoid designating contradictory rules that could result in infinite looping or infinite recursion.

Claim 16. (original) The method of claim 14 wherein said steps of arranging, associating and defining further comprises avoiding duplication of rules, sets of rules and node identifiers that are members of more than one set of rules.

Claim 17. (original) The method of claim 14 wherein said steps of arranging, associating, defining and avoiding comprises the step of organizing said rules in a directed acyclic format or graph (DAG) data structure.

Claim 18. (original) The method of claim 14 further comprising the step of generating an array or linked list of pointers to ones of said plurality of nodes and said another plurality of nodes applicable to a particular problem state.

Claim 19. (original) The method of claim 18 further comprising generating a pointer to at least one of said pointers of said array of pointers.

Claim 20. (original) The method of claim 14 further comprising determining a group of nodes applicable to said subject matter and generating an array or linked list of said nodes applicable to said subject matter covering all rules directly or indirectly associated with a selected node, said array including the maximum number of rules associated with a single node while avoiding inclusion of rules that would result in infinite looping or infinite recursion.

Claim 21. (original) The method of claim 16 further comprising determining a group of nodes applicable to said subject matter and generating an array or linked list of said nodes applicable to said subject matter covering all rules directly or indirectly associated with a selected node, said array including the maximum number of rules associated with a single node while avoiding inclusion of rules that would result in infinite looping or infinite recursion.

Claim 22. (original) The method of claim 17 further comprising determining a group of nodes applicable to said subject matter and generating an array or linked list of said nodes applicable to said subject matter covering all rules directly or indirectly associated with a selected node, said array including the maximum number of rules associated with a single node while avoiding inclusion of rules that would result in infinite looping or infinite recursion.

Claim 23. (currently amended) The method of claim 20 further comprising the steps of:

selecting a top level node of said another plurality of nodes as a starting node;

determining the depth of each node of said plurality of nodes and said another plurality of nodes from said starting node to the lowest level nodes;

~~providing an indication of the depth of nodes included in said generated array;~~ and

pruning rules from a node having the lowest depth level.

Claim 24. (currently amended) The method of claim 21 further comprising the steps of:

selecting a top level node of said another plurality of nodes as a starting node;

determining the depth of each node of said plurality of nodes and said another plurality of nodes from said starting node to the lowest level nodes;

~~providing an indication of the depth of nodes included in said generated array;~~ and

pruning rules from a node having the lowest depth level.

Claim 25. (currently amended) The method of claim 22 further comprising the steps of:

selecting a top level node of said another plurality of nodes as a starting node;

determining the depth of each node of said plurality of nodes and said another plurality of nodes from said starting node to the lowest level nodes;

~~providing an indication of the depth of nodes included in said generated array;~~ and

pruning rules from a node having the lowest depth level.

Claim 26. (currently amended) The method of claim 20 further comprising the step steps of:

~~introducing subject matter suitable for changing from one state to a preferred state;~~

generating a group or bucket of nodes from said array or linked list of nodes having a node with the highest common depth level to increase the speed of changing complex introduced subject matter.

Claim 27. (currently amended) The method of claim 23 further comprising the steps of:

~~introducing subject matter suitable for changing from one state to a preferred state;~~

generating a group or bucket of nodes from said array or linked list of nodes having a node with the highest common depth level to increase the speed of changing complex introduced subject matter.

Claim 28. (currently amended) The method of claim 14 and further comprising ~~introducing subject matter suitable for changing from one state to a preferred state, and~~ repeating said applying step with other rules associated with said selected node until said selected expression ~~subject matter~~ has been changed to said preferred state.

Claim 29. (currently amended) The method of claim 26 further comprising repeating said applying step with other rules associated with said selected node until said selected expression ~~subject matter~~ has been changed to said preferred state.

Claim 30. (currently amended) The method of claim 29 further comprising the steps of:

avoiding revisiting fully changed portions of said selected expression ~~introduced subject matter~~; and

following said selecting step by applying a different set of rules.

Claim 31. (currently amended) The method of claim 14 wherein said method for changing the state of selected expression ~~subject matter~~ is implemented on a computing device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 32. (currently amended) The method of claim 14 wherein said method for changing the state of selected subject matter is implemented on a computing device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 33. (currently amended) The method of claim 18 wherein said method for changing the state of selected subject matter is implemented on a computing device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 34. (currently amended) The method of claim 20 wherein said method for changing the state of selected subject matter is implemented on a computing device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 35. (currently amended) The method of claim 23 wherein said method for changing the state of selected subject matter is implemented on a computing device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 36. (currently amended) The method of claim 26 wherein said method for changing the state of selected subject matter is implemented on a computing device selected from the group comprising ~~a computer~~, a hand-held calculator and a hand-held computing device.

Claim 37. (original) The method of claim 14 wherein rules associated with said selected node are not limited to rules that always lead to achieving said preferred state.

Claim 38. (currently amended) A method of operating a hand-held computing device having a display, a processor, a keyboard and memory for teaching procedures for solving mathematical problems comprising the steps of:

- providing a master group of mathematical operations performable by said processor;

- organizing said master group of mathematical operations, said organizing comprising the steps of:

- arranging said master group of mathematical operations according to a hierarchy of rules,

- associating said master group of operations with a plurality of nodes, and associating selected ones of said plurality of nodes with another plurality of nodes, such that said plurality of nodes and said another plurality of nodes are indicative of levels of said hierarchy of said master group of mathematical operations, and

- defining unique identifiers for each of said plurality of nodes and said another plurality of nodes, said unique identifiers corresponding to individual mathematical operations or sets of related mathematical operations of said master group of mathematical operations for solving mathematical problems;

- storing a mathematical problem in memory;

- displaying said mathematical problem on said display of said hand-held computing device;

- determining a node from one of said another plurality of nodes associated with mathematical operations for solving said mathematical problem;

displaying selected ones of said unique identifiers representative of mathematical operations under said node, said mathematical operations being immediately operable on said selected mathematical problem and not limited to mathematical operations which always lead to a solution of said mathematical problem; and

in response to a user selecting one of said displayed unique identifiers; ;

applying a mathematical operation represented by said selected unique identifier to said mathematical problem; and

displaying the results of applying said mathematical operation to said mathematical problem.

Claim 39. (original) The method of claim 38 and comprising the further steps of selecting the displayed results as the mathematical problem to be solved and then repeating the steps of “displaying said mathematical problem” through the steps of “displaying the results” until said stored mathematical problem has been solved.

Claim 40. (original) The method of claim 38 wherein said unique identifiers for said plurality of nodes are selected so as to avoid designating contradicting mathematical operations that could result in infinite looping or infinite recursion.

Claim 41. (original) The method of claim 38 wherein said steps of arranging, associating and defining further comprising avoiding duplication of mathematical operations, sets of mathematical operations, and node identifiers that are members of more than one group of mathematical operations.

Claim 42. (original) The method of claim 38 wherein said hand-held computing device includes an input/output port and further comprises the steps of providing a connection between said hand-held computing device and another computing device and then exchanging data there between.

Claim 43. (original) The method of claim 38 wherein step of organizing comprises the step of organizing said rules in a directed acyclic format or graph (DAG).

Claim 44. (original) The method of claim 38 further comprising the step of generating an array or linked list of pointers to said plurality of nodes and said another plurality of nodes having said unique identifiers.

Claim 45. (currently amended) The method of claim 38 further ~~Further~~ comprising the step of generating a pointer to at least one of said pointers of said array of pointers.

46. (original) The method of claim 38 further comprising, determining a group of nodes applicable to said mathematical problem and generating an array or linked list of said nodes applicable to said mathematical problem covering all mathematical operations directly or indirectly associated with a selected node, said array including the maximum number of mathematical operations associated with a single node while avoiding inclusion of mathematical operations that would result in infinite looping or infinite recursion.

Claim 47. (original) The method of claim 38 further comprising the steps of:

- selecting a top level node of said another plurality of nodes as a starting node;

- determining the depth of each node of said plurality of nodes and said another plurality of nodes from said starting node to the lowest level nodes;

- providing an indication of the depth of nodes included in said generated array; and

- pruning rules from a node having the lowest depth level.

Claim 48. (original) The method of claim 47 further comprising the step of:

- generating a group or bucket of nodes from said array or linked list of nodes having a node with the highest common depth level to increase the speed of changing complex introduced subject matter.

Claim 49. (original) The method of claim 39 further comprising the steps of:

avoiding revisiting fully changed portions of said stored mathematical problem; and

following said selecting step by applying a different set of mathematical operations.